We claim:

1. A substantially purified immunoglobulin polypeptide or an antigen-binding fragment thereof, that specifically binds to PIPA, and has at least one or more of the following characteristics:

    A. the ability to bind to PIPA on a cancer cell;

    B. the ability to bind to a portion of PIPA that is exposed on the surface of a living cell *in vitro* or *in vivo*.

    c. the ability to deliver a therapeutic agent, toxin or detectable marker to a cancer cell expressing PIPA; and

    d. the ability to deliver a therapeutic agent, toxin or detectable marker into a cancer cell expressing PIPA.

2. The purified immunoglobulin polypeptide or antigen binding fragment of claim 1, wherein said cancer cell is selected from the group consisting of cancer cells from adrenal gland tumors, AIDS-associated cancers, alveolar soft part sarcoma, astrocytic tumors, bladder cancer (squamous cell carcinoma and transitional cell carcinoma), bone cancer (adamantinoma, aneurismal bone cysts, osteochondroma, osteosarcoma), brain and spinal cord cancers, metastatic brain tumors, breast cancer, carotid body tumors, cervical cancer, chondrosarcoma, dhordoma, chromophobe renal cell carcinoma, clear cell carcinoma, colon cancer, colorectal cancer, cutaneous benign fibrous histiocytomas, desmoplastic small round cell tumors, ependymomas, Ewing's tumors, extraskeletal myxoid chondrosarcoma, fibrogenesis imperfecta ossium, fibrous dysplasia of the bone, gallbladder and bile duct cancers, gestational trophoblastic disease, germ cell

tumors, head and neck cancers, islet cell tumors, Kaposi's Sarcoma, kidney cancer (nephroblastoma, papillary renal cell carcinoma), leukemias, lipoma/benign lipomatous tumors, liposarcoma/malignant lipomatous tumors, liver cancer (hepatoblastoma, hepatocellular carcinoma), lymphomas, lung cancer, medulloblastoma, melanoma, meningiomas, multiple endocrine neoplasia, multiple myeloma, myelodysplastic syndrome, neuroblastoma, neuroendocrine tumors, ovarian cancer, pancreatic cancers, papillary thyroid carcinomas, parathyroid tumors, pediatric cancers, peripheral nerve sheath tumors, phaeochromocytoma, pituitary tumors, prostate cancer, posterious unveal melanoma, rare hematologic disorders, renal metastatic cancer, rhabdoid tumor, rhabdomysarcoma, sarcomas, skin cancer, soft-tissue sarcomas, squamous cell cancer, stomach cancer, synovial sarcoma, testicular cancer, thymic carcinoma, thymoma, thyroid metastatic cancer, and uterine cancers (carcinoma of the cervix, endometrial carcinoma, and leiomyoma).

3. An isolated nucleic acid sequence coding for the immunoglobulin polypeptide or antigen-binding fragment thereof of claim 1.
4. The nucleic acid claim of claim 3, wherein the nucleic acid is operably linked to a promoter.
5. The nucleic acid of claim 4, wherein the promoter and the nucleic acid are contained in an expression vector.
6. The nucleic acid of claim 3, wherein the polypeptide is a monoclonal antibody.
7. A cell line transfected, transformed or infected with a vector containing a nucleic acid of claim 3.
8. A method of producing a substantially purified immunoglobulin polypeptide, or an antigen binding fragment thereof, comprising the steps of:

A. Growing a cell line transformed with the nucleic acid of claim 3 under conditions in which the immunoglobulin polypeptide or antigen binding fragment is expressed; and

B. Harvesting the expressed immunoglobulin polypeptide or fragment.

9. The method of claim 8, wherein the cell line is a hybridoma.

10. The method of claim 9, wherein the hybridoma is ATCC No. PTA-4220.

11. The method of claim 8, wherein the immunoglobulin polypeptide is a monoclonal antibody

12. A pharmaceutical composition comprising a therapeutically effective dose of the purified immunoglobulin or antigen-binding fragment of claim 1, together with a pharmaceutically acceptable carrier.

13. A pharmaceutical composition comprising a therapeutically effective dose of a monoclonal antibody or an antigen binding fragment thereof that specifically binds to PIPA, and has at least one or more of the following characteristics:

a. the ability to bind to PIPA on a cancer cell;

b. the ability to bind to a portion of PIPA that is exposed on the surface of a living cell *in vitro* or *in vivo*;

c. the ability to deliver a therapeutic agent, toxin or detectable marker to a cancer cell expressing PIPA; and

d. the ability to deliver a therapeutic agent, toxin or detectable marker into a cancer cell expressing PIPA;

together with a pharmaceutically acceptable carrier.

14. The pharmaceutical composition of claim 13, wherein the composition comprises an additional therapeutic moiety.

15. An isolated cell line consisting of ATCC No. PTA-4220, or progeny thereof.

16. A method for delivering a chemotherapeutic agent to a cancer cell comprising administering a composition comprising an anti-PIPA antibody associated with the

chemotherapeutic agent, wherein the cancer cell is selected from the group consisting of cancer cells from adrenal gland tumors, AIDS-associated cancers, alveolar soft part sarcoma, astrocytic tumors, bladder cancer (squamous cell carcinoma and transitional cell carcinoma), bone cancer (adamantinoma, aneurismal bone cysts, osteochondroma, osteosarcoma), brain and spinal cord cancers, metastatic brain tumors, breast cancer, carotid body tumors, cervical cancer, chondrosarcoma, dhordoma, chromophobe renal cell carcinoma, clear cell carcinoma, colon cancer, colorectal cancer, cutaneous benign fibrous histiocytomas, desmoplastic small round cell tumors, ependymomas, Ewing's tumors, extraskeletal myxoid chondrosarcoma, fibrogenesis imperfecta ossium, fibrous dysplasia of the bone, gallbladder and bile duct cancers, gestational trophoblastic disease, germ cell tumors, head and neck cancers, islet cell tumors, Kaposi's Sarcoma, kidney cancer (nephroblastoma, papillary renal cell carcinoma), leukemias, lipoma/benign lipomatous tumors, liposarcoma/malignant lipomatous tumors, liver cancer (hepatoblastoma, hepatocellular carcinoma), lymphomas, lung cancer, medulloblastoma, melanoma, meningiomas, multiple endocrine neoplasia, multiple myeloma, myelodysplastic syndrome, neuroblastoma, neuroendocrine tumors, ovarian cancer, pancreatic cancers, papillary thyroid carcinomas, parathyroid tumors, pediatric cancers, peripheral nerve sheath tumors, phaeochromocytoma, pituitary tumors, prostate cancer, posterious unveal melanoma, rare hematologic disorders, renal metastatic cancer, rhabdoid tumor, rhabdomysarcoma, sarcomas, skin cancer, soft-tissue sarcomas, squamous cell cancer, stomach cancer, synovial sarcoma, testicular cancer, thymic carcinoma, thymoma, thyroid metastatic cancer, and uterine cancers (carcinoma of the cervix, endometrial carcinoma, and leiomyoma).

17. The method of claim 16, wherein the chemotherapeutic agent is administered to an individual.

18. The method of claim 16, wherein the hybridoma is ATCC No. PTA-4220 or progeny thereof.

19. A method of inhibiting growth of cancer cells in an individual comprising administering to the individual an effective amount of a composition comprising an anti-PIPA antibody associated with a chemotherapeutic agent to the individual, wherein the cancer cells are selected from the group consisting of cancer cells from adrenal gland tumors, AIDS-associated cancers, alveolar soft part sarcoma, astrocytic tumors, bladder cancer (squamous cell carcinoma and transitional cell carcinoma), bone cancer (adamantinoma, aneurismal bone cysts, osteochondroma, osteosarcoma), brain and spinal cord cancers, metastatic brain tumors, breast cancer, carotid body tumors, cervical cancer, chondrosarcoma, dhordoma, chromophobe renal cell carcinoma, clear cell carcinoma, colon cancer, colorectal cancer, cutaneous benign fibrous histiocytomas, desmoplastic small round cell tumors, ependymomas, Ewing's tumors, extraskeletal myxoid chondrosarcoma, fibrogenesis imperfecta ossium, fibrous dysplasia of the bone, gallbladder and bile duct cancers, gestational trophoblastic disease, germ cell tumors, head and neck cancers, islet cell tumors, Kaposi's Sarcoma, kidney cancer (nephroblastoma; papillary renal cell carcinoma), leukemias, lipoma/benign lipomatous tumors, liposarcoma/malignant lipomatous tumors, liver cancer (hepatoblastoma, hepatocellular carcinoma), lymphomas, lung cancer, medulloblastoma, melanoma, meningiomas, multiple endocrine neoplasia, multiple myeloma, myelodysplastic syndrome, neuroblastoma, neuroendocrine tumors, ovarian cancer, pancreatic cancers, papillary thyroid carcinomas, parathyroid tumors, pediatric cancers, peripheral nerve sheath tumors, phaeochromocytoma, pituitary tumors, prostate cancer, posterious unveal melanoma, rare hematologic disorders, renal metastatic cancer, rhabdoid tumor, rhabdomysarcoma, sarcomas, skin cancer, soft-tissue sarcomas, squamous cell cancer, stomach cancer, synovial sarcoma, testicular cancer, thymic carcinoma, thymoma, thyroid metastatic cancer, and uterine cancers (carcinoma of the cervix, endometrial carcinoma, and leiomyoma).

20. The method of claim 19, wherein the chemotherapeutic agent is delivered into the cancer cells.

21. The method of claim 19, wherein the anti-PIP antibody is a monoclonal antibody expressed by hybridoma ATCC No. PTA-4220 or progeny thereof.

22. A method for detecting the presence or absence of a cancer cell in an individual comprising contacting cells from the individual with an anti-PIPA antibody, and detecting a complex of PIPA from the cells and the antibody, if any, wherein the cancer cell is selected from the group consisting of cancer cells from adrenal gland tumors, AIDS-associated cancers, alveolar soft part sarcoma, astrocytic tumors, bladder cancer (squamous cell carcinoma and transitional cell carcinoma), bone cancer (adamantinoma, aneurismal bone cysts, osteochondroma, osteosarcoma), brain and spinal cord cancers, metastatic brain tumors, breast cancer, carotid body tumors, cervical cancer, chondrosarcoma, dhordoma, chromophobe renal cell carcinoma, clear cell carcinoma, colon cancer, colorectal cancer, cutaneous benign fibrous histiocytomas, desmoplastic small round cell tumors, ependymomas, Ewing's tumors, extraskeletal myxoid chondrosarcoma, fibrogenesis imperfecta ossium, fibrous dysplasia of the bone, gallbladder and bile duct cancers, gestational trophoblastic disease, germ cell tumors, head and neck cancers, islet cell tumors, Kaposi's Sarcoma, kidney cancer (nephroblastoma, papillary renal cell carcinoma), leukemias, lipoma/benign lipomatous tumors, liposarcoma/malignant lipomatous tumors, liver cancer (hepatoblastoma, hepatocellular carcinoma), lymphomas, lung cancer, medulloblastoma, melanoma, meningiomas, multiple endocrine neoplasia, multiple myeloma, myelodysplastic syndrome, neuroblastoma, neuroendocrine tumors, ovarian cancer, pancreatic cancers, papillary thyroid carcinomas, parathyroid tumors, pediatric cancers, peripheral nerve sheath tumors, phaeochromocytoma, pituitary tumors, prostate cancer, posterious unveal melanoma, rare hematologic disorders, renal metastatic cancer, rhabdoid tumor, rhabdomysarcoma, sarcomas, skin cancer, soft-tissue sarcomas, squamous cell cancer,

stomach cancer, synovial sarcoma, testicular cancer, thymic carcinoma, thymoma, thyroid metastatic cancer, and uterine cancers (carcinoma of the cervix, endometrial carcinoma, and leiomyoma).

23. An agent that blocks at least one of the following interactions between PIPA and a PIPA binding partner:

a. the ability to bind to PIPA on a cancer cell;

b. the ability to bind to a portion of PIPA that is exposed on the surface of a living cell *in vitro* or *in vivo*;

c. the ability to deliver a therapeutic agent, toxin or detectable marker to a cancer cell expressing PIPA; and

d. the ability to deliver a therapeutic agent, toxin or detectable marker into a cancer cell expressing PIPA.

24. A pharmaceutical composition comprising a therapeutically effective dose of an agent according to claim 23, together with a pharmaceutically acceptable carrier.

25. A PIPA modulator, having at least one of the following characteristics:

a. the capability to disrupting or blocking the interaction between human PIPA and a native PIPA ligand;

b. the capability of disrupting or blocking the interaction between human PIPA and an anti-PIPA antibody;

c. the capability of binding to human PIPA;

d. the capability of binding to a native ligand for human PIPA;

e. the capability of binding to an anti-PIPA antibody;

f. contains an antigenic site that can be used in the raising of antibodies capable of binding to human PIPA, a native PIPA ligand or a anti-PIPA antibody;

g. contains an antigenic site that can be used in the screening of antibodies capable of binding to human PIPA, a native PIPA ligand or an anti-PIPA antibody;

h. contains an antigenic site that can be used in the raising of antibodies capable of disrupting or blocking the interaction between human PIPA and a native PIPA ligand or between PIPA and an anti-PIPA antibody;

i. contains an antigenic site that can be used in the screening of antibodies capable of disrupting or blocking the interaction between human PIPA and a native PIPA ligand or between PIPA and an anti-PIPA antibody.